CLAIMS

1. A method for detecting at least one parameter representative of molecular probes fixed to active zones of a sensor, characterized in that said sensor consists of a network of field-effect transistors (T_1, T_2 etc.), each of which has a source region (S), a drain region (D), and a gate region which forms a said active zone (3) on which said representative parameter should be detected, and in that it comprises the following steps:

a) bringing some of said zones (3) into contact with molecular probes in order to fix said probes,

b) bathing at least these zones which have been brought into contact with molecular probes, in an electrolyte solution (6),

c) measuring at least one point of the drain current/source-gate voltage/source-drain voltage characteristic of at least two of the transistors of a first group corresponding to zones (3) brought into contact with molecular probes, so as to deduce therefrom at least one said representative parameter by comparison between at least two measurements obtained for two different zones.

2. The method as claimed in claim 1, characterized in that said measurement of at least one point of the characteristic uses the application of a given voltage (U_{DS}) between the drain and the source of at least said transistors of the first group and also the application, in a first case, of a given voltage (U_{GS}) between the gate and the source of these transistors of the first group or, in a second case, of a given drain current (I_D) to these transistors of the first group.

3. The method as claimed in either of the preceding claims, characterized in that it has a rinsing step between a and b.

4. The method as claimed in one of the

preceding claims, characterized in that it comprises, after a) and before b), the following steps:

a1) rinsing,

a2) adding a solution containing target molecules capable of interacting specifically with the molecular probes.

5. The method as claimed in one of claims 1 to 6, characterized in that it comprises, after c, the following steps:

d) adding an electrolyte solution (6) containing target molecules capable of interacting specifically with the molecular probes,

e) measuring at least one point of the drain current/source-gate voltage/source-drain voltage characteristic of at least two of the transistors of a second group corresponding to zones (3) brought into contact with molecular probes and with target molecules, so as to obtain by comparison at least one said representative parameter.

6. The method as claimed in claim 5, characterized in that, in point e, the measurement of at least one point of the characteristic uses the application of a given voltage (U_{DS}) between the drain and the source of the transistors of at least said two transistors of the second group, and the application, in a first case, of a given voltage (U_{GS}) between the gate and the source of these transistors of the second group or, in a second case, of a given drain current (I_D) to these transistors of the second group.

7. The method as claimed in either of claims 5 and 6, characterized in that it uses a plurality of said measurements of at least one point of the characteristic, which are spaced out over time.

8. The method as claimed in one of the preceding claims, characterized in that said comparison is carried out by differential measurement.

9. The method as claimed in one of the preceding claims, characterized in that the comparison is carried out between measurements carried out on at

least two transistors corresponding to zones (3) which are bathed in an electrolyte solution (6) after having been brought into contact with molecular probes.

10. The method as claimed in one of claims 1 to 8, characterized in that the comparison is carried out between measurements carried out on at least one transistor corresponding to a zone (3) which is bathed in an electrolyte solution (6) after having been brought into contact with molecular probes for the purpose of fixing them, and on at least one transistor corresponding to a zone which is bathed in said electrolyte solution (6) without having been brought into contact with molecular probes.

11. The method as claimed in one of the preceding claims, characterized in that said representative parameter is detection of the fixing of molecular probes to a said zone (3).

12. The method as claimed in one of the preceding claims, characterized in that the molecular probes are DNA, RNA or protein molecules.

13. The method as claimed in claim 12, characterized in that the molecular probes are DNA molecules and in that the field-effect transistors are of depleted n-channel type, with a negative gate bias.

14. The method as claimed in either of claims 12 and 13, characterized in that it uses detection by comparison between two zones, each comprising at least one said field-effect transistor, the first zone being bathed in a solution obtained from an enzymological reaction (for example, PCR amplification) giving a detectable product specific for the presence or the absence of a mutation in a first DNA sample, and the second zone being bathed in a solution obtained from an enzymological reaction (for example, PCR amplification) giving a DNA product specific for the presence or for the absence of a mutation in a second DNA sample.

15. The method as claimed in claim 14, characterized in that the first and the second DNA

samples originate from two patients and in that the enzymological reaction is the same for the two samples.

16. The method as claimed in claim 14, characterized in that the first and the second DNA samples are identical and originate from the same patient, and in that the enzymological reaction in the first zone is carried out under experimental conditions producing a DNA product in the absence of mutation in the first sample, and in that the enzymological reaction in the second zone is carried out under experimental conditions producing a DNA product in the presence of a mutation in the second sample.

17. The method as claimed in one of the preceding claims, characterized in that it comprises the circulation of a solution through at least one microfluid channel, so as to bring it into contact with at least one said field-effect transistor (T_1 ... T_2 etc.).